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FINAL
PRELIMINARY ASSESSMENT PLUS

PRATT AND WHITNEY AIRCRAFT GROUP
MANCHESTER, CONNECTICUT
CERCLIS NO.: CTD000844324

HALLIBURTON NUS Environmental Corporation

EPA Work Assignment No. 29-1JZZ
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Final Preliminary Assessment Plus
Pratt and Whitney Aircraft Group
Manchester, Connecticut
W.A. No. 29-1JZZ
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1.0 INTRODUCTION

The HALLIBURTON NUS Environmental Corporation Alternative Remedial Contract Strategy (HNUS ARCS/Region I) team was requested by the Region I U.S. Environmental Protection Agency (EPA) Waste Management Division to perform a Preliminary Assessment Plus (PA-PLUS) of the Pratt and Whitney Aircraft Group in Manchester, Connecticut. Tasks were conducted in accordance with the ARCS contract, the PA-PLUS Scope of Work, and Technical Specifications provided by the EPA under Work Assignment No. 29-1JZZ, which was issued to HNUS ARCS/Region I on February 4, 1992. This PA-PLUS report was completed as part of EPA's Environmental Priorities Initiative (EPI), a joint project overseen by the Resource Conservation and Recovery Act (RCRA) program and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) program, more commonly known as Superfund.

Background information used in the generation of this report was obtained through file searches conducted at the Connecticut Department of Environmental Protection and EPA, telephone interviews with town officials and individuals knowledgeable of the property history and characteristics, and conversations with other Federal, State and local agencies. Information was also collected during the HNUS ARCS/Region I on-site reconnaissance which was conducted on May 7, 1992.

This package follows the guidelines developed under Superfund. However, these documents do not necessarily fulfill the requirements of other EPA regulations such as those under RCRA or other Federal, State or local regulations. The PA-PLUS provides a preliminary screening of facility operations. The EPI represents an integrated RCRA/CERCLA approach to assessing RCRA facilities utilizing procedures that combine elements of the Superfund Preliminary Assessment (PA) and the RCRA Facility Assessment (RFA). Under the EPI, current and former hazardous waste treatment, storage and disposal facilities regulated by the RCRA program are being evaluated to determine whether corrective action may be warranted. The PA-PLUS is a limited effort and is not intended to supersede more detailed investigations.

2.0 SITE DESCRIPTION

Pratt and Whitney began operations at its Manchester facility (commonly known as the Manchester Foundry) at 15 Hall Court, Manchester, Connecticut (41° 45′ 57.24" N latitude, 72° 31 48.36" W longitude) in August 1956 (Figure 1) (1; 2; 3; 4). This property was leased from Heyman Properties until August 1988 when Pratt and Whitney moved its operations to its East Hartford facility. Information on the use of the facility prior to 1956 was not available in the available literature. The former Pratt and Whitney facility was located entirely within one building approximately 200 feet by 300 feet in size, where they manufactured airfoils for jet engines. The building is currently vacant. The surrounding area is residential and commercial, with the Velvet Mills Apartments located 50 feet north of the site. The site is bordered by Elm Street to the east and Pine Street to the west. On the south side of the building is a south-sloping, paved parking lot which covers the area from the building to the edge of Hall Court and directs surface water drainage south toward Hall Court (32 p4). A storm sewer is located southwest and downslope of the facility at the corner of Hall Court and Pine Street. The topography at the site is moderately sloping with few bedrock outcrops (15 p2).

The two potential source areas of this site are a container storage area and an underground storage tank (Figure 2). The 11 foot by 12 foot container storage area was located just east of the loading dock inside the facility. The original cement slab under the container storage area has been removed and replaced with a new layer of concrete. The 10,000-gallon underground storage tank was located approximately 20 feet southwest of the loading dock, but was removed in July 1988 in accordance with the facility's closure plan (15 p15). Multiple processes involving potentially hazardous materials were used to manufacture airfoils. Each of these processes (ie. acid etching line, vapor cabinet, and power washer) could be considered to be an area of concern; however, there is little or no information available in the reference literature which accurately describes these areas. Therefore, for the purposes of this report, the building which once housed the Pratt and Whitney Aircraft Group at 15 Hall Court will be considered an area of concern in its entirety.

Currently, access restriction to the facility is minimal. The chain-link fence around the property is not continuous, and numerous broken windows at ground level provide easy access to the building's interior (32 p4).

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3.0 SITE ACTIVITY AND HISTORY

The building of the former Pratt and Whitney facility has been vacant since the termination of the lease in 1988, and is currently empty except for a few office partitions. The site was once a part of the Cheney Mills complex, a series of mill buildings that housed ribbon, silk, and velvet manufacturing operations. These mill buildings, with the exception of the Pratt and Whitney building, have been renovated beginning in 1983, and are now apartment units (32 pp1,4,5; 35).

For over thirty years this facility used the following processes to manufacture airfoils for jet engines: metal fabrication, cleaning, degreasing, etching, Fluorescent Penetrant Inspection, boring operation, grinding, sanding, deburring, wheel cutting, and x-ray casting (16 p1). The types and amounts of wastes generated by Pratt and Whitney in 1987 are summarized in Table 1 (20 pp2,3).

These wastes were generated onsite and stored in two areas: a waste container storage area, and an underground storage tank (Figure 2). Wastes stored in the waste storage container area included ignitable wastes (denatured alcohol, and ethanol); corrosive wastes (ammonium fluoride, potassium hydroxide, potassium silicate, sodium hydroxide, acetic acid, ferric chloride, hydrochloric acid, hydrogen peroxide, nitric acid, phosphoric acid, and sulfuric acid); chrome sludge; film fixer solution; 1,1,1-trichloroethane; trichlorofluoroethane; trichloroethylene; and perchloroethylene (27). The underground storage tank contained rinsewater from the various processes. Chemicals mixed in the tank included ferric chloride, phosphoric acid, hydrochloric acid, nitric acid, emulsifier, penetrant, film fixer solution, and film developer solution. Periodically, these wastes were transported to a treatment plant at Pratt and Whitney's East Hartford facility (18 p3).

3.1 Regulatory Activities

Pratt and Whitney filed a RCRA Part A permit application in 1980, and was listed as a generator and Treatment, Storage, or Disposal Facility (TSDF). Pratt and Whitney first filed for a change of status from TSDF to non-regulated generator on May 24, 1984 (23). A RCRA inspection on January 27, 1988 indicated that Pratt and Whitney had stored hazardous wastes longer than 90 days (11 p1). In light of this violation, the status change request was denied by the Connecticut Department of Environmental Protection (22). A final RCRA inspection was conducted on March 28, 1990 at the facility prior to its closure. The report indicated that no wastes were present onsite (18 p1).

TABLE 1
HAZARDOUS WASTES GENERATED BY PRATT AND WHITNEY IN 1987

Waste and Process	Amount/year (pounds)
Corrosive and spent acids from metal etching; aqueous mixture of phosphoric acid, hydrochloric acid, and ferric chloride.	4,301
Corrosive spent x-ray auto fixer solution from reproduction equipment containing silver.	2,059
Corrosive spent alkali from autoclave coreleaching process; aqueous mixture of potassium hydroxide and sodium hydroxide.	31,256
Toxic mixture of oil and halogenated solvents from equipment maintenance.	882
Toxic waste wax solids and still bottoms from degreaser.	1,630
Flammable spent alcohol from wax pattern wash process.	17,142
Toxic spent solvents from wax pattern; freon and 1,1,1-trichloroethane.	9,603

3.2 Operational and Closure Activities

Production at Pratt and Whitney's Manchester facility ceased on May 31, 1988, and closure activities were begun (18 p1). Closure activities were conducted in accordance with the Closure Plan developed by Loureiro Engineering Associates in June 1988. All chemicals, equipment, and storage units were removed or decontaminated. The foundation below the container storage area was decontaminated July 6, 1988, and concrete core samples were taken. The underground storage tank and associated sumps and plumbing were decontaminated and removed July 15, 1988. The below-ground sumps were filled with cement, and the excavated area was backfilled and covered with an asphalt cover (18 p9). Sampling has been conducted in accordance with the Closure Plan. Table 2 is a chronological summary of events at the Pratt and Whitney Manchester facility.

Soil samples collected from beneath the container storage area and underground storage tank were analyzed for volatile organic compounds and inorganic elements. No volatile organic compounds were detected in any of the soil samples. No inorganic elements were detected in the soil samples collected from beneath the container storage area at concentrations exceeding three times the average background concentration (25 p3, (T)2,3). Three inorganic elements (cadmium, iron, and zinc) were detected in soil samples collected from beneath the underground storage tank at concentrations exceeding three times the average background concentration. Analytical results for these elements are presented in Table 3 (26(A)K pp1...9).

During monitoring well installation in September 1990, split-spoon samples were collected and screened with an organic vapor analyzer for "relative concentrations of volatile organic compounds." No volatile organic compounds were detected; therefore, none of the samples were submitted for laboratory analysis (15 p8). Following well installation, groundwater samples were collected in October 1990, and in January, April, and July of 1991 (15 p11). The samples were analyzed for dissolved silver and pH in accordance with the Closure Plan for the underground storage tank. Silver was not detected in any of the samples. The pH of the samples ranged from 7.09 to 8.16 (15 pp12,15). The groundwater samples were not analyzed for volatile or semivolatile organic compounds, nor were they analyzed for any other inorganic elements.

TABLE 2
CHRONOLOGICAL SUMMARY OF EVENTS
AT PRATT AND WHITNEY AIRCRAFT GROUP

DATE	EVENT
07-15-88	Underground storage tank removed. Noted to be in "good condition" with "relatively little corrosion" (17 p17).
09-20-90	Five shallow monitoring wells installed around underground storage tank (21 p7).
09-28-90	Concrete chip samples collected from tunnel below container storage area (21 p7).
10-02-90	Background concrete chip samples taken from tunnel, and concrete removal begun (21 p7).
10-06-90	Concrete removal completed (21 p7).
10-08-90	Soil samples collected from beneath former container storage area (21 p7).
11-01-90	Results of soil and concrete chip samples submitted to CT DEP. Soil sample results are below criteria cited in Closure Plan; concrete samples have lead and arsenic levels above criteria cited in Closure Plan (21 p7).
02-04-91	CT DEP states the container storage area meets clean closure standards, but further decontamination of tunnel area is necessary (21 p7).
03-14-91	Tunnel recleaned and sample locations resampled (21 p7).
04-04-91	Results of tunnel sampling submitted to CT DEP (21 p7).
05-07-91	DEP states tunnel sampling results not adequate. Entire tunnel area to be recleaned and resampled for lead only (21 p7).

TABLE 2 (Continued)
CHRONOLOGICAL SUMMARY OF EVENTS
AT PRATT AND WHITNEY AIRCRAFT GROUP

DATE	EVENT
06-25-91	Tunnel recleaned (21 p7).
07-08-91	Tunnel resampled (21 p7).
07-22-91	Results submitted to CT DEP; Pratt and Whitney states that lead levels are below health-based criteria and therefore the container storage area meets clean closure standards (21 p7).
10-07-91	Pratt and Whitney submits certification of closure for container storage area to CT DEP (24).

TABLE 3
ELEMENTS IN SOIL SAMPLES FROM BENEATH THE UNDERGROUND STORAGE TANK AT CONCENTRATIONS > 3 X AVERAGE BACKGROUND

Element	Maximum Concentration Detected (ppm)	Average Background Concentration* (ppm)	Ratio
Cadmium	5.8	1.9	3.1
Iron	23,000	5,633	4.1
Zinc	350	56	6.3

* Average of results from samples MF-Dirt-G, MF-Dirt-I, and MF-Dirt J; results for background sample MF-Dirt-H were not available (26(A)K pp1...9).

4.0 ENVIRONMENTAL SETTING

4.1 Geology and Hydrogeology

The overburden of the area is dominated by glacial and post-glacial sediments that include till, stratified drift, and swamp deposits. These ice contact deposits are generally pale yellowish-brown to grayish-red stratified sand and gravel with an average thickness of 25 feet. Samples taken from monitoring well drilling performed by Fuss and O'Neill Consulting Engineers revealed three distinct units of stratified drift. The uppermost layer is brownish-red, fine to coarse grained sand deposits mixed with silt and gravel. The layer below is a dense reddish-brown layer of fine grained sand and silt with alternating beds of sand, silt and clay. The deepest of the three layers is reddish-gray, coarse to fine sand with alternating layers of silt and clay.

The bedrock in the area is generally classified as Portland Arkose which is comprised mainly of reddish-brown to gray siltstone, sandstone, and conglomerates formed during the Triassic Period. Bedrock samples taken at the site were reddish-gray siltstone of the Portland Arkose Formation. Bedrock was found 33 feet below ground surface (15 p3).

4.2 Groundwater

There are 8 public water supply wells within the 4 mile radius of the former Pratt and Whitney facility, serving 31,455 people (Figure 3). The nearest municipal well is 0.7 miles southeast of the site (13 p237). Table 4 lists the population within the four mile radius of Pratt and Whitney, and the populations served by

municipal and private wells within the 4 mile radius. All water from municipal wells in Manchester is blended before distribution (13 p237; 31; 33; 34). Groundwater in the Manchester area is classified as GB (36). Information on the specific locations of private wells was not available (31). Additional references providing more detailed information regarding uses of groundwater in the were not available.

4.3 Surface Water

Surface water runoff from the property is towards Hop Brook which is located 300 yards southeast of the property (32 p5). Hop Brook flows west 1.2 miles to its confluence with the South Fork of the Hockanum River which flows northeast 1.4 miles to Laurel Lake. Water exits Laurel Lake into the Hockanum River, flows 5.8 miles west, and empties into the Connecticut River. The Connecticut River flows south, extending beyond 15 stream miles from the former facility (1; 4; 5; 6). Hop Brook is classified by the Connecticut Department of Environmental Protection (CT DEP) as a Class A water body (15 p4). This classification indicates that the surface water body could potentially be used as a drinking water supply, and is suitable for fish and wildlife habitats, as well as recreational, agricultural, or industrial uses (19 p194). The Hockanum Brook is classified as Bc near the Hop Brook and as C/Bc near Laurel Lake (36). Laurel Lake is also classified as a Class C/Bc water body indicating that water quality standards are not being met for one or more designated uses due to pollution (15 p4). The Connecticut River is classified as SC/SB (36).

Of the three major surface water bodies on the 15 mile downstream surface water pathway, Hop Brook has the lowest streamflow at 14.8 cubic feet per second (cfs). The Hockanum River has an average annual streamflow of 115 cfs, and the Connecticut River has a current maximum flow of 93,200 cfs as measured at the Bulkeley Bridge gauging station (30). There are no known drinking water intakes along the Hop Brook or the Hockanum River (31).

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TABLE 4
POPULATION LOCATED IN, AND SERVED BY GROUNDWATER SOURCES WITHIN, FOUR MILES OF PRATT AND WHITNEY AIRCRAFT GROUP MANCHESTER, CONNECTICUT

DISTANCE RING (MILES)	RESIDENTIAL POPULATION (13 p237)	POPULATION SERVED BY MUNICIPAL WELLS * (13 p237)		POPULATION SERVED BY PRIVATE WELLS (33; 34)	TOTAL POPULATION SERVED BY WELLS
0.00 - 0.25	874	0		2	2
0.25 - 0.50	2,605	0		7	7
0.50 - 1.0		3,424	WELL #9		
		5,469	WELL #10		
	10,685	8,893 TOTAL		27	8,920
1.0 - 2.0		3,885	WELL #8		
		3,424	WELL #11		
	23,352	7,309 TOTAL		110	7,419
2.0 - 3.0		2,213	NEW STATE		
		400	WELL #12		
	16,840	2,613 TOTAL		183	2,796
3.0 - 4.0		432.5	WELL #1		
		432.5	WELL #2		
		36	WELL #13		
	23,020	901 TOTAL		776	1,677
TOTALS	77,376	19,716		1,105	20,821

* *See Figure 3 for locations of municipal wells.*

4.4 Populations

There are presently no onsite workers at the former Pratt and Whitney facility, and there are no students or residents within 200 feet of either of the former waste management units which are both located on the south side of the facility. The nearest residents live in the Velvet Mills Apartments, approximately 50 feet north of the former facility and approximately 250 feet north of the former waste management units. There are approximately 77,376 people living within a four mile radius of the former Pratt and Whitney facility (13 p237).

4.5 Fisheries

There was no information available for annual production or stocking of the water bodies within the 15 mile downstream surface water pathway; however, the Hop Brook, Hockanum River, and Connecticut River are all used for recreational fishing. The Hop Brook has the lowest flow characteristic of the three fisheries, with a streamflow of 14.8 cfs.

4.6 Sensitive Environments

There are 2.61 miles of wetland frontage along the 15 mile surface water pathway. Additional information regarding sensitive environments was not found in the available literature (7; 8; 9; 10).

5.0 SUMMARY

Pratt and Whitney Aircraft Group leased property at 15 Hall Court in Manchester, Connecticut from August 1956 to August 1988. Throughout this period, Pratt and Whitney manufactured airfoils for jet engines, using such processes as metal fabrication, cleaning, degreasing, etching, Fluorescent Penetrant Inspection, boring operation, grinding, sanding, deburring, wheel cutting, and x-ray casting. Pratt and Whitney ceased its operations at 15 Hall Court in 1988. Because of the presence of two waste management units on the property, a container storage area and an underground storage tank, Pratt and Whitney is currently undertaking steps to obtain approval for closure.

No volatile organic compounds were detected in soil samples from below the container storage area and the underground storage tank. Cadmium, iron, and zinc were found in soil samples from below the underground storage tank at concentrations greater than three times the average background concentration.

Results of groundwater monitoring revealed no dissolved silver present, and pH levels ranging from 7.09 to 8.16. The groundwater samples were not analyzed for volatile organic compounds, semivolatile organic compounds, or inorganic elements other than silver.

There are 25,247 people within a 4-mile radius of the facility served by groundwater; the closest municipal well is 0.7 miles away. The nearest residents live in an apartment complex 50 feet from the facility; the facility has little access restriction.

At this time EPA recommends that Pratt and Whitney Aircraft Group in Manchester, Connecticut be deferred to the RCRA program for further evaluation.

APPENDIX A
AREA OF CONCERN (AOC) INFORMATION

AREA OF CONCERN (AOC) STATUS SUMMARY

Area of Concern	AOC Description	Start-up Date/ Closure Date	Release Status	References
#1 Container storage area	11'x 12' storage area with bermed concrete floor- handled multiple waste types.	Concrete slab removed December 6, 1990.	Low potential for release	12 p1; 17 p3 21 p7;
#2 Underground storage tank	One 10,000 gallon hazardous waste tank	Removed July 15, 1988.	Low potential for release	15
#3 Building (acid etching line, vapor blast cabinet, power washer)	Multiple processes invol- ving numerous chemicals were used at the site	August 1956/ July 1988	Low potential for release	17 p4;

AOC #1

AOC Name - Container storage area

AOC Status - Low potential for release

AOC Description

An 11'x 12' container storage area located east of the loading dock inside the facility with a maximum storage volume of 500 gallons (12 p1; 17 p3).
There was no information available as to the volume of waste routinely handled at the container storage area.

AOC Start-Up Date -

UNKNOWN

AOC Closure Date -

Facility closure May 31, 1988 (18 p1)
Slab removal November 6, 1990 (21 p7)

Wastes Managed at AOC

Multiple waste types were stored in the container storage area, including ignitable and corrosive wastes, chrome sludge, silver, spent solvents, and acids (27).

Release Controls

The flooring of the container storage area was concrete. Minor cracks were found. Containment was provided by steel angle berms caulked and anchored to the concrete slab (12 p1; 17 pp3,6).

Release History

No volatile organic compounds were detected in soil samples beneath the container storage area, and no inorganic elements were detected in concentrations exceeding three times the average background concentration (25 p3, (T)2,3). No evidence of any release was observed during the site reconnaissance because the former slab under the container storage area had been removed and replaced with a new slab . This new slab appeared free of any staining. No field survey instruments were used in the investigation of this unit (32 p1).

AOC #2

AOC Name - Underground storage tank

AOC Status - Low potential for release (26 (A)K pp1..9)

AOC Description

This unit consisted of one 10,000 gallon tank buried under the parking lot on the south side of the facility, approximately three feet below ground level. The tank was 16 feet long with a 10.5 foot diameter and was constructed of welded steel. The tank was installed in 1955, and received waste water from the various processes ongoing at the facility. The tank was removed in July 1988 (14 p1; 15 p2). There was no information available as to the volume of waste routinely handled in the underground storage tank.

AOC Start-Up Date

UNKNOWN

AOC Closure Date

Facility closure May 31, 1988 (18 p1).
Tank removal July 15, 1988 (15 p2).

Wastes Managed at AOC

This unit handled rinsewaters form the various processes at the facility. Wastes included ferric chloride, hydrochloric acid, nitric acid, phosphoric acid, penetrant, fixers and developers (18 p3).

Release Controls

There is no indication from the EPA or state files that any release controls were ever present at this area of concern. The tank has since been excavated and removed from the facility, and "appeared to be in good condition. Relatively little corrosion had occurred (17 p17)."

Release History

Analysis of soil samples taken from under the underground storage tank revealed concentrations of cadmium, iron, and zinc at levels exceeding three times the average background concentration. Groundwater was analyzed for dissolved silver and pH only. No dissolved silver was detected, and pH levels ranged from 7.09 to 8.16. No analyses were completed for volatile organic compounds, semivolatile organic compounds, or inorganic elements.

AOC #3

AOC Name - Pratt and Whitney Aircraft Group, Manchester Facility Building.

AOC Status - Low potential for release (26 (A)K pp1..9)

AOC Description

This AOC consisted of numerous processes used in the manufacturing of airfoils for jet engines. An acid etching line, a vapor blast cabinet, and a power wash for wax mold removal were all used within the Pratt and Whitney facility, as well as other processes not mentioned within the available literature (17 p4).

AOC Start-Up Date

August 1956

AOC Closure Date

Facility closure May 31, 1988 (18 p1).
AOC closure in accordance with Closure Plan still pending

Wastes Managed at AOC

This unit handled rinsewaters form the various processes at the facility. Wastes included ferric chloride, hydrochloric acid, nitric acid, phosphoric acid, penetrant, fixers and developers (18 p3). Additional wastes at this AOC included ignitable and corrosive wastes, chrome sludge, silver, spent solvents, and acids (27).

Release Controls

There is no indication from the EPA or state files that any release controls were ever present at this area of concern.

Release History

No sampling of or leaking from the building including the process lines has been documented.

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